AN EMPIRICAL ANALYSIS OF THE CORPORATE EFFECT: THE IMPACT OF THE MULTINATIONAL CORPORATION ON THE PERFORMANCE OF ITS UNITS WORLDWIDE [*]

Manuel Becerra

Instituto de Empresa
Dept. Strategy Management
C/ María de Molina, 12, 5º
28006, Madrid – Spain
manuel.becerra@ie.edu

Abstract

This paper investigates the sources of variability of MNC performance in different areas of the world, particularly the influence of corporate-level factors, the geographical areas, and their specific industries.

The key goal is to measure to what extent MNC corporate-level resources, such as ownership advantages and core competencies, affect the performance of the MNC´s international subsidiaries.

Keywords

Variance decomposition analysis shows that between 5% and 12% of the performance of MNCs in different parts of world can be attributed to the corporation as a whole. This corporate effect is larger for more highly internationalized firms.

Short title: An Empirical Analysis Of The Corporate Effect in MNCs

[*] **Acknowledgement:** I would like to thank Anil Gupta, Judy Olian, Stefan Wally, and Gabriel Benito for their helpful comments on an earlier version of this paper

Introduction

The literature on international diversification and performance constitutes one of the central topics in the field of international business (Hitt/Hoskisson/Kim 1997; Dess/Gupta/ Hennart/Hill 1995). Researchers have suggested a number of reasons why multinational corporations may enjoy a significant advantage over their less internationalized competitors, such as greater market opportunities (Buhner 1987), benefits from internalization and integration (Rugman 1981; Kobrin 1991), increased market power and lower risk (Kim/Hwang/Burgers 1989), greater opportunities from learning (Kogut 1984), and many other arguments generally related to acquiring and using "ownership advantages" in a variety locations through internal means (Dunning 1988; Delios/Beamish 1999).

The mixed empirical evidence points toward some positive relationship between international scope and performance (Kim/Hwang/ Burgers 1989), probably curvilinear (Hitt et al. 1997), and moderated by the extent of product diversification (Hitt et al. 1997; Delios/Beamish 1999), what would explain the insignificant results obtained in some studies (Geringer/Beamish/daCosta 1989). This line of research has been criticized for being often descriptive rather than analyzing why we observe certain empirical association (Dess et al. 1995). More recently, however, researchers are probing further into what lies behind the performance implications of international diversification and, for instance, whether greater performance results from greater geographical scope or vice versa (Delios/Beamish 1999).

This paper is aimed at expanding this line of research from a different angle. Rather than explaining the direct impact of international diversification on MNC performance, we will study the sources of variability of MNC performance worldwide, particularly its corporate-level resources and the moderating role of international diversification. The focus is, thus, placed on the relative importance of the different factors that drive the performance of MNCs throughout the world, i.e. how global is indeed the performance of MNCs throughout their different local units. The key research questions to be investigated are: How much, if anything, of the performance of a MNC in different geographical areas of the world is attributable to the corporation as a whole? How does the degree of internationalization affect the size of this corporate effect?

As mentioned above, the extant empirical research on the international diversification-performance relationship is based on the assumption that ownership advantages drive the performance of the MNC and that greater unique advantages of the MNC should be empirically observable in the higher performance of more internationalized firms. The empirical studies of this stream of research try to estimate this relationship between internationalization and performance through a regression coefficient. In contrast, this paper investigates the relative influence of the entire MNC versus other factors that presumably explain the performance of their lower-level units worldwide. In addition, we will also study whether more internationalized MNCs have greater or smaller relative impact on the performance of their geographical units.

This paper draws heavily in its methodology and underlying motivation from recent research on strategic management that investigates the sources of variance of firm performance and, particularly, the relative effects of the industry, the corporation, and the business unit in diversified companies (Rumelt 1991; McGahan/Porter 1997). The study brings this research approach into the international arena, where the focus is now on the performance of the MNC across different geographical areas and, mainly, the corporate effect in multinationals. Such a

corporate effect plays an important role in the theory of International Business that has not been empirically investigated and measured yet. The next section discusses the results from previous research in the field of strategy in order to better understand the meaning of the corporate effect in diversified corporations. Later, this notion is extended to the international context of MNCs. The following sections present the methodology used in the study and the conclusions regarding the effect of corporate-level factors on the performance of MNCs in different geographical areas worldwide.

The Corporate Effect

The corporate effect for diversified firms

For about a decade, scholars in the fields of Strategy and Industrial Organization Economics have engaged in an interesting debate about the relative importance of different sources of organizational performance (Schmalensee 1985; Hansen/Wernerfelt 1989; Rumelt 1991; Powell 1996; Roquebert/Phillips/Westfall 1996; McGahan/Porter 1997). Using several methods of variance decomposition, these researchers have estimated how much of the performance of the business units in their samples can be attributed to: (1) the industry in which the units compete, (2) the corporation to which they belong, (3) unit-specific factors stable through time, and (4) other factors and random variations in business unit performance. Using typically a set of dummy variables that reflect the industry, the corporation, and the period in which the performance of a business unit was observed (e.g., ROA), a components of variance analysis would estimate how much of the performance is attributable to the industry, the corporation, and the business unit (its specific influence stable through time). Despite some differences in methodologies and datasets, the results of this line of research are starting to converge into a reasonably coherent picture of sources of organizational performance. Industry membership seems to be an important factor that accounts for an average of almost 20% of business-unit performance. This result, first obtained by Schmalensee (1985), highlights the relevance of the industry and the competitive context in which firms operate. On the other hand, business-unit specific factors stable through time account for nearly 40% of business-unit performance (Rumelt 1991; Roquebert et al. 1996). Thus, business-level considerations seem to be twice as relevant as industry-level influences in explaining organizational performance (Rumelt 1991; Hansen/Wernerfelt 1989; Powell 1996). This result provides empirical support for the claim to study firm strategies beyond the analysis of industry structure and attractiveness (Rumelt 1991).

The corporate effect has been more difficult to detect empirically. Schmalensee (1985) and Rumelt (1991) showed their surprise to find only a negligible impact of corporations over their business units using data from the FTC database in manufacturing industries. More recently, other researchers have detected a larger corporate effect using different approaches (Roquebert et al. 1996; McGahan/Porter 1997; Brush/Bromiley/Hendrickx 1999). For instance, McGahan/Porter (1997) studied manufacturing and other types of industries and they reported an average corporate effect of about 5% in their Compustat study, though this effect was not empirically found in manufacturing industries.

As it is measured and tested in these studies, a negligible corporate effect in this context would mean that the performance of a corporation's business units in different industries is hardly due to corporate-level factors. In other words, corporate strategy would not matter and we should investigate differences in profitability directly across business units and industries. In terms of Rumelt (1991): "if one business-unit within a corporation is very profitable, there

is little reason to expect that any of the corporation's other business-units will be performing at other than the norms set by industry, year, and industry-year effects."

The corporate effect detected by more recent empirical research provides evidence that indeed the corporate office has an impact on the performance of its businesses, either creating or destroying value through their management of the diversified firm. Diversified companies may be able to benefit from vertical, synergistic, and financial economies generated by having different businesses under the same corporate umbrella (Hill/Hoskisson 1987). It is the role of the corporate office to make sure that these economies are realized through their administrative (loss prevention) and entrepreneurial (value-creation) activities throughout the entire organization (Chandler 1991).

Unfortunately, the corporate office can also affect performance by destroying value with their activities and additional bureaucratic costs. Goold/Campbell/Alexander (1994) claimed that headquarters create or, in light of their qualitative evidence, more often destroy value in four ways: offering centralized services, establishing connections between businesses, making vital decisions about their businesses' strategies and top appointments, and buying and selling businesses. The first two activities pertain to the notions of synergy and economies of scope that may occur when related businesses are linked through the corporate structure. In contrast, the last two derive from the direct influence and skills of the corporate office, such as the superior corporate-level capabilities, the core competencies, and the top managers' dominant logic that are transferred to the corporation's businesses. In their attempt to exploit these synergies and core competencies, the corporate office has a significant effect on the performance of their businesses.

The corporate effect in MNCs

The previous discussion and the existing empirical research have dealt exclusively with the effect of corporate-level resources of firms competing in different businesses. In addition to product diversification, however, the corporate office, wherever it may be located, also manages geographical diversification. In MNCs, their headquarters, regional offices, and centers of excellence have the responsibility to integrate the activities of the organization worldwide. The impact of corporate-level resources on the international operations and performance of the MNC worldwide constitutes the essence of the ownership advantages that lie behind the nature of the MNC, particularly the generation and the transfer of knowledge across borders (Dunning 1988; Bartlett/Ghoshal 1989).

MNCs need to develop operational capabilities to manage interdependencies and various resource flows through the MNC network (Roth/Schweiger/Morrison 1991). These capabilities include, for instance, the coordination and configuration of the functional activities worldwide (Porter 1986) and the managerial philosophy shared throughout the MNC (Bartlett/Ghoshal 1989). There is a vast literature that analyzes the different control and coordination activities of the MNC corporate office and the change in its role toward more subtle coordination mechanisms (Doz/Prahalad 1981; Martinez/Jarillo 1989; Ferlie/Pettigrew 1996). This activity of coordination of subsidiaries can be a source of value for the MNC and their subsidiaries (Kogut 1985). For instance, Nohria/Ghoshal (1994) have shown that MNCs can improve the performance of their subsidiaries, and thus the entire MNC, by differentiating the structure of the headquarters-subsidiary relations to fit the context of the subsidiary or by building shared values across headquarters and subsidiaries.

In an international business context, corporate-level decisions and competencies, like their ability to coordinate the activities among their geographically-dispersed units, can have a direct impact on the performance of the subsidiaries worldwide. In fact, the units of the MNC depend on the corporation as a whole for key human, financial, technological, and managerial resources and for their coordination activities (Doz/Prahalad 1981). These resources that reside at the corporate level and are used throughout the MNC should impact all their international subsidiaries and their performance in the local markets. Such an impact should be empirically detectable by the corporate effect and it would reflect to what extent there are MNC-level factors behind the performance of its lower-level geographical units (e.g., MNC ownership advantages). In this paper, we want to measure how large is this MNC corporate effect relative to other factors that may drive the performance of MNCs in its different geographical areas, such as industry influences.

Extent of internationalization and the size of the corporate effect

The argument above deals with the presumed impact that various corporate-level factors should have on the international subsidiaries of the MNC. We could also expect this influence to be relatively larger when the MNC has more or better corporate-level resources to share across its subsidiaries or transfer to them. When properly managed, the corporate office facilitates the realization of the economies from internationalization through their activities of control and coordination within the MNC (Doz/Prahalad 1981). These activities have an impact on the performance of each of their international subsidiaries and, through aggregation, in the entire MNC. It is reasonable to believe that more internationalized MNCs may perform more of these activities and share the benefits (and costs) with the subsidiaries. These MNCs can take greater advantage of the economies of scale, scope, and learning that having international presence provides by standardizing products, rationalizing production, and coordinating critical resources (Kogut 1985; Kobrin 1991), thus showing a greater corporate effect in the performance of its different units worldwide.

This idea is also consistent with traditional internalization theory (Rugman 1981; Dunning 1988). MNCs with a larger international presence may take advantage of globalization and worldwide learning to build a competitive advantage for the entire MNC (Rugman 1981). Assuming that ownership advantages allows firms to become MNCs in the first place (Hymer 1960; Dunning 1988), those MNCs with larger ownership advantages can be expected to become more highly internationalized. In this case, we should also observe a greater corporate effect for more internationalized MNCs, though the driving force would be the initial amount of corporate-level resources and advantages that facilitate the process of internationalization. It should be noted that this paper is not aimed at clarifying the causality direction between extent of internationalization and a MNC´s corporate-level factors, but the empirical analysis of the MNC corporate effect and how it relates to the extent of MNC internationalization.

A positive relation between the size of the corporate effect and the extent of internationalization is also consistent with the abundant empirical literature that has detected a positive relationship between degree of internationalization and MNC performance (Buhner 1987; Kim/Kwang/Burgers, 1989; Rugman 1979). However, a corporate effect would also be detectable with any other relationship, whether linear or not, such as a quadratic relationship (Hitt/Hoskisson/Kim 1995) and even a negative association (Geringer/Beamish/daCosta 1989). The key idea is not whether international diversification provides an intrinsic advantage or disadvantage to the MNC, like Grant/Jammine/Thomas (1988) claim, or, based

on the opposite causality relationship, whether the extent of internationalization results from the amount of ownership advantages available to the MNC. Our goal is to measure whether indeed more internationalized MNCs have a larger corporate effect, relative to other factors that could presumably drive the performance of MNC in different geographical areas worldwide.

In other words, this is a measurement paper where we want to estimate the relative size of the corporate effect for MNCs and whether the size of the corporate effect depends on the extent of internationalization of the MNC. The arguments supporting the notion of a detectable MNC corporate effect on its lower-level units is already implicit in the existing literature in strategy and international business, but it has not been measured in terms of relative impact, nor has been estimated for different levels of internationalization. In the next section, we will discuss different ways to estimate this effect as well as the sample of MNCs used for the estimation.

Methodology

Data

To investigate the corporate effect in MNCs, a sample of corporations was obtained from the Compustat database. This database compiles data from the Securities and Exchange Commision and other sources, such as stock price changes and accounting statements of the corporations and their business segments, including performance data for American corporations in different parts of the world. In contrast to Roquebert et al. (1996) and McGahan/Porter (1997), who used the Compustat Business Segment Reports, this study is based on the Geographic Segments Reports that provides data about the corporations' performance in different countries or regions in the world.

The 100 largest American corporations from the 1994 Standard and Poor's list were initially considered for the analysis. Every company in the S&P100 reported data for their U.S. operations and one third also for their activities in Canada. However, there was wide variation in the denomination of their other international operations, usually one country per continent and occasionally the continent itself. To reduce empty cells in the design and to allow meaningful comparisons, these international operations were aggregated to the continent level. The unit of analysis is, therefore, the MNC in each of five geographic areas worldwide (MNC-area): the U.S., Canada, Europe, Asia, and South America.

Annual data on Net Income and Identifiable Assets from 1991 to 1994 were collected for each MNC-area to compute Return on Assets (ROA), the performance measure traditionally used in research on sources of performance (Rumelt 1991; McGahan/Porter 1997). The 4-digit primary-SIC code was used to determine each MNC's main industry.

From this initial sample of the MNC-areas of the S&P100 firms, two additional changes were made to improve balance in the research design and to make more similar the number of observations in each cell. First, firms that were not sufficiently internationalized (i.e., have operations in at least three of the five areas worldwide) were dropped from the sample. Second, industries with too small representation (i.e., less than three corporations in the sample) were also eliminated. The final dataset consisted of 506 observations, which represent 41 American MNCs in 11 industries, 5 geographic areas, and data for four years for the 134 MNC-areas in the sample. Therefore, each observation contains the dependent variable (ROA for the MNC-area) and a set of dummy codes: year (4), industry (11), corporation (41), area

(5), and MNC-area (134). The dummy codes would capture how much of the variability in ROA in the sample can be attributed to the different year, industries, corporations, geographical areas, and lower-level units within the MNC (MNC-areas). The characteristics of the sample produced a complex research design in which corporation is nested within industry and MNC-area is nested within corporation, industry, and area. Descriptive statistics for the sample are shown in Table 1.

Methods

Different methodologies can be used to decompose the observed variability in MNC-area ROA into the five independent variables under study (i.e., sources of performance): year, industry, corporation, area, and MNC-area effects. In the case of the corporate effect for MNCs, these variance decomposition methodologies measure the extent to which the performance of the MNCs in different parts of the world can be attributed to the whole MNC worldwide, as opposed to the specific industry, area, year, and non-random MNC-area factors stable through time. Since the corporate effect is measured through a dummy variable for each MNC, it actually estimates the part of the performance of the MNC-areas shared throughout the entire MNC. It includes, therefore, any direct impact of the MNC corporate office as well as any other tangible or intangible resources of the MNC as a whole that affects the performance of its lower-level units worldwide.

The different effects can be estimated through hierarchical regression analysis in which the independent variables are added in a sequence of steps. The increase in R^2 of the last set of dummy variables indicates the relevance of such an effect. A test of significance can be performed for each step and the increase in R^2 for each one measures the relative effect of each source of performance. Unfortunately, since MNC-areas are nested within corporations, we cannot regress MNC-area first and then the corporate dummies, because the MNC-areas would capture all the variability. However, if we regress corporations first and then the MNC-areas, we could not be sure that the variability absorbed by the corporate dummy variables is not really due to lower level variability in MNC-areas (Rumelt 1991). Thus, hierarchical OLS regression (fixed-effects ANOVA) should be interpreted with caution only as a maximum possible estimate for the corporate effect (Bowman/Helfat 1998).

An alternative methodology widely used in previous research is the variance components approach (Schmalensee 1985; Rumelt 1991; Roquebert et al. 1996; McGahan/Porter 1997). As discussed by Rumelt (1991) and McGahan/Porter (1997), we can estimate the relative importance of the different effects all at once, despite the nesting of the model. The percentage of variance explained by each effect relative to the total variance can be used to gauge the importance of each effect. Variance components is considered more appropriate that fixed-effects hierarchical regression when the levels of each effect (e.g., dummies for corporations) are supposed to be drawn from a larger population of units rather than exhaust all their possible value and, therefore, when the results are intended to be generalizable to the larger population of firms as opposed to the set of MNCs in the sample. Furthermore, this methodology allows a much more efficient use of degrees of freedom, since only five parameters need to be estimated, i.e., the variances for the effects[1].

We will also use a similar alternative methodology closer to the experimental design tradition: Repeated Measures ANOVA. Compared to the random-factors ANOVA described above (called 'variance components' in econometrics terminology), this method is particularly appropriate for longitudinal research. Repeated Measures ANOVA also allows the researcher

to test for the significance of the effects in a longitudinal sample under the assumption of either fixed- or random-factors. This method becomes necessary when the statistical symmetry conditions are not met in the data (Bergh 1995). Otherwise, the results can produce distorted F-statistics for the effects, which can lead to flawed conclusions (Boik 1981). The variance-covariance matrixes of the within-groups design and the between-groups design need to have certain characteristics that Bergh (1995) describes in detail. If these are not present in the data, the researcher can obtain adjusted values, such as those from an epsilon modification process (e.g., Huynh-Feldt).

In the next section we will estimate the different effects using these three alternative methods. Though the actual estimates are expected to differ across methods, a large corporate effect in all three of them would lend support for the importance of understanding and managing corporate-level resources in the MNC. Given the emphasis on the measurement of the size of the corporate effect in this paper, it was considered appropriate to present the results from these three alternative methods to observe the robustness of the results across methodologies based on different assumptions.

Results

First, a traditional fixed-effects hierarchical regression analysis (OLS) was conducted with the sets of dummy variables introduced in the following order: period, area, industry, corporate, and MNC-area. The full model shown in Table 2 provided an adjusted R^2 of .67. When the corporate dummy variables were included in the model, the R^2 increased .12 (significant at .001 level). This figure is similar to Rumelt's (1991) and McGahan/Porter's (1997) estimates of .15 and .09 respectively. However, as discussed in the previous section, the 12% estimate should be interpreted with caution, only as the maximum possible magnitude of the actual corporate effect in MNCs.

Table 3 presents the components of variance computed from the Expected Mean Square estimates obtained from the GLM procedure in SAS when all effects are considered random in this nested design[ii]. The estimates of McGahan/Porter (1997), Roquebert et al. (1996), Rumelt (1991), and Schmalensee (1985) are also reported. We can see that 4.71% of the variability in the performance of the MNC-areas in our study is attributable to corporate effects. This result is consistent with the 4.3% corporate effect for the business units of domestic corporations obtained by McGahan/Porter (1997), though it is substantially smaller than the 17.9% reported by Roquebert et al. (1996) for their full sample results, which decreased to about 5% when the less diversified corporations were excluded.

Table 4 shows the variance components computed from the Expected Mean Squares estimates obtained from the GLM procedure in SAS when all factors are considered random in a repeated measures design. Now, only effects for area, industry, and corporate (nested within industry) can be estimated. The results for the Between Subjects factors are provided for the whole sample and after dividing the sample in two: low and high internationalization industries. The symmetry conditions for the data and the two sub-samples were not satisfied based on the results of the Mauchly's W test for the Within Subjects design and the Box's M test for the Between Subjects design, which confirms the need to use a Repeated Measures ANOVA instead of a traditional random-factors ANOVA to test for significance.

For the whole sample of the Repeated Measures ANOVA, the area effect is a negligible 1%, the corporate effect is approximately 9%, and industry factors account for 45% of the variability in MNC-area performance (based on the main effects). With regard to the within-Subjects design, it should be noted that the results are automatically adjusted by SAS using Huynh-Feldt epsilon[iii]. As shown in the lower part of Table 4, the period effect and the period*area interaction are insignificant, but the period*industry and the period*corporate interactions are significant. This means that the influence of the industry and the corporation on the performance of the MNC-areas varies over time, beyond the 9% stable corporate effect estimated by the Between Subjects analysis above. In certain years, the corporation (and the entire industry) has significant influence on the performance of its operations in different areas of the world.

To investigate how the extent of internationalization affects the size of the corporate effect, the sample was divided in two parts to replicate the analysis in both subsamples. The eleven industries in the sample were split into two groups based on their ratio of foreign assets to total assets obtained from Compustat as an indicator of the average degree of internationalization. Five industries have an internationalization ratio greater than 50% and six industries have a lower ratio. This cut-off point divides reasonably well the sample, leaving 20 MNCs in the high internationalization group and 21 in the low internationalization group. The same methodology described above was then used to estimate the variance components of the Between Subjects factors and the interactions of the Within Subjects design. The results reported in Table 4 show that the corporate effect is much larger for the highly internationalized sub-sample (11%) in contrast to the less internationalized MNCs subsample (3%). In addition, the period*corporate interaction is significant, but only for the highly internationalized sub-sample, thus, also providing further evidence that the corporate effect is greater for more highly internationalized MNCs.

Discussion

This study expands to an international context the investigation on sources of organizational performance. Using a variance decomposition approach, the analysis shows that a corporate effect can be detected for a sample of some of the largest American MNCs worldwide and that it accounts for approximately 5% to 12% of their performance in different areas of the world, depending on the methodology used. We find empirical evidence of the extent to which the performance of MNCs in different geographical area is driven by corporate factors. Though these factors are not analyzed in detail in this paper, they are widely used in the strategy and IB literature (e.g., core competencies and ownership advantages). These corporate-level factors are employed by MNCs worldwide and they have an empirically measurable impact on the performance of the MNC in different regions, though such an effect had not been measured by earlier research as this paper does.

Even after taking into consideration the impact of time, industry, geographic area, and lower-level MNC-area performance, there are systematic differences in the performance of MNCs in different parts of the world. These differences can be attributed to corporate-level resources, that is, a corporate effect. The results provide an empirical justification to the study of corporate strategy in multinational corporations. Having detected empirically such an effect, researchers in international business should continue investigating why some corporations have a larger impact on their worldwide performance than other MNCs.

However, MNC corporate resources are obviously not all that matters. Industry and MNC-area specific effects also exist and they are much more important, each one accounting for about 30% to 45% of the variability in performance of MNC across geographical areas. Based on the observed results, we could claim that how well a MNC is managed in a certain geographical area and the specific characteristics of the industry in which it is operating have a greater impact in the ultimate profitability of the MNC subsidiaries than the unique characteristics and resources of their parent corporation. In other words, local factors seem to matter more than global factors. Though the corporate management of the MNC as a whole matters, management at the regional level and the characteristics of the industries in which the MNC competes have an even greater effect on the performance of those regional areas.

The results also indicate that the extent of internationalization determines the size of the corporate effect. The evidence of a larger corporate effect for more highly internationalized MNCs contrasts with Roquebert et al. (1996) empirical finding that firms with greater product diversification showed a smaller corporate effect. It seems that product and international diversification have very different consequences for the influence of the corporation as a whole in the performance of their lower-level units. Actually, this is consistent with the empirical research that studies the different nature of product and international diversification and their unlike influences on MNC performance (Grant/Jammine/Thomas 1988). Whereas greater product diversification dilutes the effect that corporate resources may have on their businesses, greater internationalization allows the MNCs to develop and to leverage their own corporate resources worldwide.

The corporate effect also changes through time. The positive period*corporate interaction indicates that in specific years the MNC has significantly greater impact on their international operations. These temporary fluctuations in the corporate effect deserve further investigation. Thus, to some extent, corporate influence may be punctuated phenomena rather than having a stable and sustained impact on its international subsidiaries.

Future research could also analyze the small size of the geographical area effect. The trend toward greater globalization of markets and strategies may be facilitating the internal convergence of the performance of the MNC in different parts of the world, regardless of the effect of the geographical region in which the MNC has activities.

Conclusion and Limitations

This paper was aimed at finding empirical evidence of a MNC corporate effect on the performance of its units in different regions of the world. This corporate effect is implicit in much of the IB literature, but its size had not been estimated yet. Using three different statistical methodologies, the corporate effect was estimated to contribute from 5% to 12% of the variability of ROA in the regional units of large American MNCs. This corporate effect was found to be greater for the more internationalized subsample of MNCs.

These results, however, should be taken with some caution given particularly the limitations of the dataset. First, the sample is comprised of 41 of the largest American corporations, such as IBM and General Motors. It is not clear to what extent the results can be generalized to smaller firms with international operations or to those from a non-USA country of origin. Replication of this type of study with data from MNCs from other countries and size would shed more light on this issue. Second, given the current impossibility of obtaining comparable performance data at the country level, we had to aggregate the results provided by the

Compustat database to five unequal regions in the world in order to have a reasonably balanced design to estimate the different effects. In the search for improved balance, the data obviously lose precision and we will have to wait until new databases become available with sufficiently detailed comparable data to make the entire analysis at the country level. In any case, it is reasonable to believe that the aggregation of data at the regional level may have reduced the estimate for the area effect, but it probably does not have a large impact on the corporate effect. Finally, it should be noted that the estimation of the different effects is based on dummy variables, as it is traditional in the study of source of performance in the strategy field (Rumelt 1991; McGahan/Porter 1997). In this paper, there was no attempt to measure specific types of corporate influence, like ownership advantages or core competencies, for instance. The goal was to measure how much of the variability in ROA of MNCs in different geographical areas of the world can be attributed to the MNC as a whole. This is what dummy variables for the MNC (and the other sources of performance variability) allow us to measure, but it does get into the nature of such effects. Despite these limitations, the results seem to be robust across different methodologies, which provide sufficient empirical evidence about the existence of a MNC corporate effect moderated by the extent of internationalization of the MNCs, though more accurate estimates and in different contexts will certainly appear in the IB literature in the future.

Table 1. Descriptive Statistics

1.- Sample Characteristics

134 MNC-areas for 4 years = 506 total observations in:
- 41 U.S. MNCs
- 5 geographical areas
- 11 industries

2.- Average Profitability:

* By Period	ROA	MNC-areas	MNCs
1. Year 1991	.1232	123	41
2. Year 1992	.1000	126	40
3. Year 1993	.0960	128	41
4. Year 1994	.0906	129	41
For Periods 1-4 (total sample)	.1022	506	41
* By Area			
1. U.S.	.1169	160	41
2. Canada	.0142	49	13
3. South America	.1448	56	15
4. Europe	.0849	133	34
5. Asia	.1198	108	29

* By Industry

				Foreign Assets to Total Assets
1. SIC 1311 Energy	.0978	32	3	18.80%
2. SIC 2000 Food	.1625	32	3	45.21%
3. SIC 2040 Processed Foods	.1562	40	3	63.54%
4. SIC 2621 Paper	.0609	37	3	36.94%
5. SIC 2800 Chemical	.1167	40	3	29.64%
6. SIC 2834 Pharmaceutical	.2370	72	6	46.48%
7. SIC 2911 Oil	.0425	79	7	57.64%
8. SIC 3570 Computers	.0078	52	4	66.59%
9. SIC 3571 Microcomputers	.0174	43	3	51.06%
10. SIC 3711 Automobiles	.0334	43	3	29.68%
11. SIC 7372 Software	.2229	36	3	52.20%

Table 2. Fixed-Effects Hierarchical Regressions

Increase Effects	df	in R^2	F value
Period	3	.008	1.316
Area	4	.060	8.083***
Industry	10	.317	25.203***
Corporate	30	.119	3.676***
MNC-area	89	.255	4.388***
Total Model	136	.759	8.565***
Error	369	.250	
R^2		.759	
Adjusted R^2		.671	

*** significant at .001 level.

Table 3. Variance Components Estimates (%)

Source	McGahan/Porter This study	Rumelt (1997)	Schmalensee (1991)	(1985)
Period	.69	2.39	0	*x*
Area	6.91	*x*	*x*	*x*
Industry	30.44	18.68	16.12	19.46
Corporate	4.71	4.33	.80	0
MNC-area (Business unit)	27.21	31.71	46.38	*x*
Error	30.04	48.40	36.70	80.54

x indicates that the variance for that effect was not estimated

Table 4. Repeated Measures ANOVA

Between Subjects Effects - Variance components estimates (%)

Source	Above 50% Foreign Assets Full Sample	F	Below 50% Foreign Assets	F	Foreign Assets	F
Area	1.10	.92	0	.30	0	.86
Industry	44.52	6.93 **	46.79	7.66 **	41.93	6.46 **
Corporate	9.06	1.57 †	10.95	1.69 †	3.05	1.15
Error	45.32		42.26		55.02	

Within Subjects Effects - Univariate Tests

Source	Full Sample F	Adj.P	Above 50% Foreign Assets F	Adj.P	Below 50% Foreign Assets F	Adj.P
Period	1.15	.35	2.68	.05†	.76	.52
Period*Area	.95	.49	.78	.67	.95	.52
Period*Industry	1.61	.02*	1.71	.07†	1.30	.21
Period*Corporate	1.34	.04*	1.54	.04*	.91	.63

**, *, † indicates significant at .01, .05, .10 level respectively
Adj.P indicates that the p-value for the variable has been adjusted using Huynh-Feldt epsilon

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Footnotes

[1] For further discussion of this methodology, its limitations, and one alternative estimation method, see Brush/Bromiley (1997) and Brush/Bromiley/Hendrickx (1999), which obtains substantially larger corporate effects.

[2] The VARCOMP procedure in SPSS produced virtually identical results.

[3] Within Subjects MANOVA analysis provided very similar results to the univariate analysis.